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9 June 1969

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MEMORANDUM FOR THE RECORD

SUBJECT: Dry-Silver Acquisition System

1. The attractiveness of dry-silver photo material, particularly as applicable to the problems of wet processing in the sensing vehicle, has made this photo duplicating material a very good candidate for modification to special the requirements of an acquisition material.

2. It appears that the basic dry-silver material and processing techniques are amenable to modification and specialization to fill the particular requirements as an acquisition material. This would assume that the temperature environment is one that would be satisfactory for solid state electronics and that the photo material would be shielded from excessive radiation prior to processing. These are normal precautions that would be necessary for any photo sensitive material. Some work has already been done with regards to recording with CRT, laser, and electron beams which indicates that satisfactory sensitivity to these particular forms of radiation can be formulated. This would make dry-silver material particularly amenable to use in an electo-optical system.

3. A speed increase for dry-silver material does not necessarily call for a loss in resolution, even though this apparently would be no problem. Resolution is a combination of a particular set of parameters, i.e., contrast, density, range, gamma variability, etc. It is entirely possible that no resolution loss would occur with an increase in speed, depending of course, on all of the other requirements. The first step in this operation would be to establish, and tie down specific development goals depending upon the system requirements.

4. As far as processing equipment is concerned, in addition to the various techniques and processors already built or being built, the [redacted] has demonstrated the feasibility of a hot air bearing, real-time processor for airborne operation. This was done in response to RFPs for the U.S. Navy chaired Joint in Flight Data Transmission System (JIFDATS). It would seem that modification and improvement of this technique would be applicable to the processing requirements of this system.

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5. As far as security is concerned, [redacted] request to expedite special clearances for key [redacted] personnel will help simplify the problem of this additional request. With the addition of the head chemist and a head engineer, personnel will be ready to start work as soon as the necessary preliminaries are completed. 25X1

6. Despite the fact that the investigation would be for special purpose acquisition requirements, it is more than likely that the Center would benefit from the additional knowledge and techniques that would "Fall out" from the effort. Additionally, the increased interest of the Government in the dry-silver system will doubtless encourage the [redacted] to make increasingly more of their funds and facilities available for the development. 25X1

7. Estimating roughly, it would appear that there is a small-to-fair development risk in achieving the very general requirements outlined for acquisition use. This is based upon past performance, and present knowledge and is, of course, subject to the actual specifications required for the equipment and material.

8. The stated film speed (ASA 0.2) is available only on a laboratory basis--not on scaled-up version as yet.

9. A satisfactory low speed printer/processor has been developed but it could not really be called "commercially available," even though a "chinese copy" could probably be produced in less than six months. The High Speed Processors have not yet been completely tested or accepted. Final tests are expected in September or October 1969.

10. The acquisition speeds required can probably be obtained with additional time and manpower working on problem. (NOTE - NPIC stands to benefit by any speed increase even though special trade-offs are different).

11. It is estimated that the film is almost suitable for electro-optical system as it stands, would probably work very well with small additional formulation changes.

12. If it were decided that DED, NPIC were to monitor this project, it is felt that little additional effort or expense would be required, since regular monitoring is already necessary for NPIC contracted requirements. It is felt that NPIC would benefit greatly, not only from increased R&D knowledge in dry-silver photography, but also from the increased effort and possible increased production requirements for dry-silver. Additionally, this project shows how NPIC R&D efforts can be of benefit not only to other components of the Agency but to the entire intelligence community.

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